

CLAIMS

1. An isolated polypeptide comprising all or a distinctive fragment of BACE455.
- 5 2. The polypeptide of claim 1 comprising all or a distinctive fragment of the amino acid sequence SEQ ID NO: 2.
3. The polypeptide of claim 2, which comprises an amino acid sequence selected from the group consisting of SEQ ID Nos 3-11.
- 10 4. An isolated polynucleotide encoding the polypeptide of claim 1, 2 or 3.
5. The polynucleotide of claim 4, comprising the sequence of SEQ ID NO: 1.
- 15 6. A vector comprising the polynucleotide of claim 4 or 5.
7. A nucleic acid probe selected from the group consisting of a) a first nucleic acid that selectively hybridizes to a second nucleic acid encoding a BACE455 polypeptide or a distinctive fragment thereof, and b) a third nucleic acid that is exactly complementary to said first nucleic acid.
- 20 8. A nucleic acid primer that can be used to amplify at least a distinctive fragment of a nucleic acid molecule encoding a BACE455 polypeptide.
- 25 9. An inhibitory nucleic acid molecule, wherein said molecule hybridizes under physiological conditions to a nucleic acid molecule encoding a BACE455 polypeptide and selectively inhibits transcription or translation thereof.
10. A host cell comprising a polynucleotide of claim 4 or a vector of claim 6.
- 30 11. A polynucleotide selected from the group consisting of a) a nucleic acid comprising a first nucleotide sequence that hybridizes under stringent conditions to the nucleic acid sequence set forth in SEQ ID NO 1, and b) a nucleic acid comprising a second nucleotide sequence exactly complementary to said first nucleotide sequence.
- 35 12. A ligand able to selectively bind a BACE455 polypeptide or a distinctive fragment thereof.

13. The ligand of claim 12, which comprises a polypeptide selected from the group consisting of an antibody, a fragment of an antibody, or a derivative of an antibody.
- 5 14. The polypeptide of claim 13, which binds a distinctive fragment of a BACE455 polypeptide.
15. A BACE455 inhibitor, wherein said inhibitor inhibits the expression or activity of a BACE455 polypeptide or nucleic acid.
- 10 16. A pharmaceutical composition comprising a BACE455 inhibitor and a pharmaceutically acceptable carrier or vehicle.
- 15 17. A method of treating or preventing a neurodegenerative diseases or an associated disorder in a subject, the method comprising administering to said subject an effective amount of a BACE455 inhibitor.
- 20 18. A method of treating or preventing production or accumulation of A β peptide in a subject, the method comprising administering to said subject an effective amount of a BACE455 inhibitor.
- 25 19. A method of selecting, characterizing, screening or optimizing a biologically active compounds, said method comprising contacting a test compound with a BACE455 nucleic acid, polypeptide, or distinctive fragment of said nucleic acid or polypeptide and determining whether said test compound binds said BACE455 nucleic acid or polypeptide or modulates an activity of said BACE455 nucleic acid or polypeptide.
- 30 20. A method of detecting the presence of or predisposition to a neurodegenerative disease or an associated disorder in a subject, the method comprising detecting the presence of a BACE455 nucleic acid or polypeptide in a sample from the subject.
21. A method of assessing the response of a subject to a treatment of a neuro-degenerative disease or an associated disorder, the method comprising detecting the presence of a BACE455 nucleic acid or polypeptide in a sample from the subject.
- 35 22. A method of determining the efficacy of a treatment of a neurodegenerative disease or an associated disorder in a subject, the method comprising (i) determining the presence and/or

abundance of a BACE455 nucleic acid or polypeptide in a sample taken from said subject during or after said treatment, and (ii) comparing said presence and/or abundance to a reference sample from said subject prior to or at an earlier stage of the treatment.

- 5 23. A method for making an antibody that binds a BACE455 polypeptide, the method comprising immunizing a non-human animal with a BACE455 polypeptide or a distinctive fragment thereof, and collecting antibodies or antibody-producing cells from said animal.
- 10 24. A method of making a composition comprising a BACE455 inhibitor, the method comprising:
 - iv) selecting a compound that inhibits BACE455,
 - v) producing said compound, and
 - vi) mixing said compound with a pharmaceutically acceptable salt thereof.